PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 16 October 2000 (16.10.00)	
International application No. PCT/EP00/01476	**Applicant's or agent's file reference** 33190/GM/ch
International filing date (day/month/year) 23 February 2000 (23.02.00)	**Priority date** (day/month/year) 24 February 1999 (24.02.99)
Applicant ZENTI, Maximiliano	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

13 September 2000 (13.09.00)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Olivia TEFY
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

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From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING SUBMISSION OR TRANSMITTAL OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

To:

MODIANO, Guido
Modiano & Associati
Via Meravigli, 16
I-20123 Milano
ITALIE

Date of mailing (day/month/year) 10 April 2000 (10.04.00)	
Applicant's or agent's file reference 33190/GM/ch	**IMPORTANT NOTIFICATION**
International application No. PCT/EP00/01476	International filing date (day/month/year) 23 February 2000 (23.02.00)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 24 February 1999 (24.02.99)
Applicant ZENTI, Maximiliano	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).

2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.

3. An **asterisk(*)** appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

4. The **letters "NR"** appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, **the attention of the applicant is directed** to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
24 Febr 1999 (24.02.99)	VR99A000021	IT	06 Apri 2000 (06.04.00)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer

Céline Faust

Telephone No. (41-22) 338.83.38

International application No.
PCT/EP00/01476

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The following person is [X] agent [ ] common representative

and [X] has been appointed earlier and represents the applicant(s) also for international preliminary examination.

[ ] is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.

[ ] is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

MODIANO Guido - JOSIF Albert - PISANTY Maurizio
STAUB Gabriella - MODIANO ALAGEM S. Lara
ZANOTTI Nemo - RENIERO C. Silvano
c/o MODIANO & ASSOCIATI
Via Meravigli, 16 - 20123 MILANO - ITALY
All Italian citizens and professional representatives before the EPO.

Telephone No.: 0039 02 869 2442

Facsimile No.: 0039 02 863 860

Teleprinter No.:

[ ] **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION

Statement concerning amendments:*

1. The applicant wishes the international preliminary examination to start on the basis of:

[X] the international application as originally filed

the description
[ ] as originally filed
[ ] as amended under Article 34

the claims
[ ] as originally filed
[ ] as amended under Article 19 (together with any accompanying statement)
[ ] as amended under Article 34

the drawings
[ ] as originally filed
[ ] as amended under Article 34

2. [ ] The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3. [ ] The applicant wishes the start of the international preliminary examination **to be postponed** until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: ENGLISH

[X] which is the language in which the international application was filed.
[ ] which is the language of a translation furnished for the purposes of international search.
[ ] which is the language of publication of the international application.
[ ] which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

Box No. V ELECTION OF STATES

The applicant hereby **elects all eligible States** *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes **not to elect:**

Sheet No. . 3

International application No.
PCT/EP00/01476

Box No. VI CHECK LIST

The demand is accompanied by the following documents for the purposes of international preliminary examination:

			For International Preliminary Examining Authority use only: received	not received
1. amendments under Article 34				
description	:	sheets	☐	☐
claims	:	sheets	☐	☐
drawings	:	sheets	☐	☐
2. letter accompanying amendments under Article 34	:	sheets	☐	☐
3. copy of amendments under Article 19	:	sheets	☐	☐
4. copy of statement under Article 19	:	sheets	☐	☐
5. other *(specify)*:	:	sheets	☐	☐

The demand is also accompanied by the item(s) marked below:

1. ☐ separate signed power of attorney
2. ☐ copy of general power of attorney
3. ☐ statement explaining lack of signature
4. [XX] fee calculation sheet
5. [XX] other *(specify)*: Voucher

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

Milan, Italy - September 7, 2000

MODIANO Guido

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. ☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

PATENT COOPERATION TREATY

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From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:
Modiano, Guido
MODIANO & ASSOCIATI
Via Meravigli, 16
I-20123 Milano
ITALIE

NOTIFICATION OF RECEIPT OF DEMAND BY COMPETENT INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

(PCT Rules 59.3(e) and 61.1(b), first sentence and Administrative Instructions, Section 601(a))

Date of mailing *(day/month/year)*	02.10.00
Applicant's or agent's file reference: 33190/GM/ch	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP 00/01476	23/02/2000	24/02/1999

Applicant: ZENTI, Maximiliano

1. The applicant is hereby **notified** that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

13/09/2000

2. This date of receipt is:

- [x] the actual date of receipt of the demand by this Authority (Rule 61.1(b)).
- [ ] the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).
- [ ] the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.

3. [ ] **ATTENTION:** That date of receipt is **AFTER** the expiration of 19 months from the priority date. Consequently, the election(s) made in the demand does (do) not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)). Therefore, the acts for entry into the national phase must be performed within 20 months from the priority date (or later in some Offices) (Article 22). For details, see the *PCT Applicant's Guide*, Volume II.

[ ] *(If applicable)* This notification confirms the information given by telephone, facsimile transmission or in person on: _____

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. (+49-89) 2399-0, Tx: 523656 epmu d Fax: (+49-89) 2399-4465	BACHER M Tel. (+49-89) 2399-8615

EUROPÄISCHES PATENTAMT · EUROPEAN PATENT OFFICE · OFFICE EUROPÉEN DES BREVETS

PATENT COOPERATION TREATY

(12)

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

Modiano, Guido
MODIANO & ASSOCIATI
Via Meravigli, 16
I-20123 Milano
ITALIE

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing *(day/month/year)*	24.11.2000
Applicant's or agent's file reference: 33190/GM/ch	**REPLY DUE** **within 3 month(s)** from the above date of mailing

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP00/01476	23/02/2000	24/02/1999

International Patent Classification (IPC) or both national classification and IPC

A01G1/00

Applicant

ZENTI, Maximiliano

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

I	☒	Basis of the opinion
II	☐	Priority
III	☒	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV	☐	Lack of unity of invention
V	☒	Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI	☐	Certain document cited
VII	☒	Certain defects in the international application
VIII	☐	Certain observations on the international application

3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4. For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis. For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 24/06/2001.

Name and mailing address of the international preliminary examining authority:

European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Bunn, D

Formalities officer (incl. extension of time limits)

Salaün, M

Telephone No. +49 89 2399 2126

I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*):

Description, pages:

1-11 as originally filed

Claims, No.:

1-22 as originally filed

Drawings, sheets:

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   - ☐ the description, pages:
   - ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been and will not be examined in respect of:

☐ the entire international application,

☒ claims Nos. 15,

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 15 are so unclear that no meaningful opinion could be formed (*specify*):
see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

2. A written opinion cannot be drawn due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrialapplicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1,3-5,7,8,14,19,20,22
Inventive step (IS)	Claims	2,6,9-11,16-18,21

Industrial applicability (IA) Claims

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

III. Non-establishment of opinion

1. Claim 15 merely relates to a result to be achieved, which merely amounts to a statement of the underlying problem, and fails to disclose the technical features necessary for achieving this result.

V. Reasoned statement

1. WO-A-98 56232 (D1) discloses (p.15, l.23 - p.17, para.3 & p.21, para.5 - p.22, para.1) a method of preparing a plant cultivation comprising preparing a seeding bed and introducing seeds therein, dividing the seeding bed into sods, cohesion treatment, drying, laying and moistening as specified in claim 1. It follows that the subject matter of claim 1 fails to meet the requirements of novelty, Article 33(2) PCT. While there is no *specific* disclosure of a drying step, it is apparent that, with a hot melt type glue being used (p.17, para.3), then subsequent drying will take place before the sod obtains its finished state. Should it be disputed that there is no true drying step, then it should be noted that D1 discloses a further embodiment (p.23, para.3 - p.26, para.3 & fig.8) which *does* embrace a specific drying step.

   It follows from the foregoing that D1 further discloses a sod for cultivating plants obtained with the method of claim 1, comprising a seeded seeding bed including a fertilizer (i.e. sphagnum moss) and held together by a suitable organic bonding agent (i.e. hot melt type glue). It follows that the subject matter of claim 14 also fails to meet the requirements of novelty, Article 33(2) PCT.

2. Concerning the dependent claims:
   - claims 3-5,7,8,19,20 & 22 are known from D1, and lack novelty, Article 33(2) PCT;
   - claims 2,6 & 9-11 relate to obvious modifications of method claim 1, while claims 16-18 & 21 relate to obvious modifications of product claim 14, and thus lack an inventive step, Article 33(3) PCT.
   - claims 12 & 13 are not derivable from the available prior art, and so meet the requirements of Article 33 PCT.

VII. Certain defects

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1 is not mentioned in the description, nor is this document identified therein.

2. Claim 12 relates to the step of *mixing*, which is first mentioned in claim 3, and so cannot be "according to any preceding claim".

PATENT COOPERATION TREATY

(15)

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

Modiano, Guido
MODIANO & ASSOCIATI
Via Meravigli, 16
I-20123 Milano
ITALIE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing *(day/month/year)*	31.05.2001
Applicant's or agent's file reference 33190/GM/ch	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP00/01476	23/02/2000	24/02/1999

Applicant
ZENTI, Maximiliano

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Riebel, O Tel.+49 89 2399-2967

Form PCT/IPEA/416 (July 1992)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
33190/GM/ch		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP00/01476	23/02/2000	24/02/1999
International Patent Classification (IPC) or national classification and IPC A01G1/00		
Applicant ZENTI, Maximiliano		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
13/09/2000	31.05.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Bunn, D Telephone No. +49 89 2399 2086

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/01476

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1,2,4-11	as originally filed	
3	with telefax of	03/04/2001

Claims, No.:

1-21	with telefax of	03/04/2001

Drawings, sheets:

1/2,2/2	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	2,6,9-13,15-17,20
	No:	Claims	1,3-5,7,8,14,18,19,21
Inventive step (IS)	Yes:	Claims	12,13
	No:	Claims	2,6,9-11,15-17,20
Industrial applicability (IA)	Yes:	Claims	1-21
	No:	Claims	

2. Citations and explanations
   see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

V. Reasoned statement

1. WO-A-98 56232 (D1) discloses (p.15, l.23 - p.17, para.3 & p.21, para.5 - p.22, para.1) a method of preparing a plant cultivation comprising preparing a seeding bed and introducing seeds therein, dividing the seeding bed into sods, cohesion treatment, laying and moistening as specified in the preamble of claim 1.
Furthermore, D1 comprises the additional steps whereby:
- the seeding bed is prepared using dry materials (p.18, para.3 - i.e. *prior to* their being transformed into a slurry); and
- before laying the sod a drying step is performed on the sod (it is apparent that, with a hot melt type glue being used [p.17, para.3], then subsequent drying will take place before the sod obtains its finished state. Should it be disputed that there is no true drying step, then it should be noted that D1 discloses a further embodiment [p.23, para.3 - p.26, para.3 & fig.8] which specifically embraces a drying step).
It follows that the subject matter of claim 1, as far as it is understandable in view of the clarity objections (see below, point VIII.1), fails to meet the requirements of novelty, Article 33(2) PCT.

2. It follows from the foregoing that D1 further discloses a sod for cultivating plants obtained with the method of claim 1, comprising a seeded seeding bed including a fertilizer (i.e. sphagnum moss) and held together by a suitable organic bonding agent (i.e. hot melt type glue). It follows that the subject matter of claim 14 also fails to meet the requirements of novelty, Article 33(2) PCT.

2. Concerning the dependent claims:
- claims 3-5,7,8,18,19 & 21 are known from D1, and lack novelty, Article 33(2) PCT;
- claims 2,6 & 9-11 relate to obvious modifications of method claim 1, while claims 15-17 & 20 relate to obvious modifications of product claim 14, and thus lack an inventive step, Article 33(3) PCT.
- claims 12 & 13 are not derivable from the available prior art, and so meet the requirements of Article 33 PCT.

VII. Certain defects

1. The applicant has deleted from originally-filed claim 1 the feature whereby the sod is *nondestructively* dried. This feature is presented as essential in the original disclosure of the invention (p.3, l.9-21). It follows that its deletion introduces subject-matter extending beyond the content of the application as filed, contrary to Article 34(2)(b) PCT.

VIII. Certain observations

1. Claim 1 fails to meet the requirements of clarity, Article 6 PCT:
   a) The characterising portion comprises the specific feature whereby "*before laying the sod* a drying step is performed on the sod". However, according to the introduction to claim 1, the operating steps of the claimed method can be "also in a different time sequence", thus rendering the scope of the claim unclear;
   b) The term "dry" as used in the newly-introduced feature "the seeding bed is prepared using dry materials" is a relative one with no well-recognised meaning; in other words, a material may be considered *dry* in one particular situation, but may be considered *moist* in another.

CLAIMS

1. A method of preparing a plant cultivation, particularly a lawn, comprising, also in a different time sequence, the following operating steps:

-- preparing a seeding bed and introducing seeds therein;

-- dividing the seeding bed into sods;

-- cohesion treatment, whereby the resulting sod is not brittle, makes it possible to maintain a geometric shape and allows proper handling until the laying step is completed;

-- laying the sod and

-- moistening the sod before or after laying and regular watering afterwards, characterized in that said seeding bed is prepared using dry materials and before laying the sod a drying step is performed on the sod.

2. The method according to claim 1, characterized in that after drying the sod is packaged in a suitable package for its preservation, storage and transport, preferably under vacuum.

3. The method according to claim 1 or 2, characterized in that said preparation of a seeding bed comprises the dosage of the components and the mixing thereof.

4. The method according to claim 1 or 2, characterized in that said preparation of a seeding bed is obtained by depositing successive layers of various components.

5. The method according to any preceding claim, characterized in that said division into sods occurs by molding the mix in a template, die or by extrusion in the chosen sod shape.

6. The method according to any claim 1 to 4, characterized in that said division into sods occurs by die-cutting.

7. The method according to any preceding claim, characterized in that said seed insertion occurs by implantation with a seeding machine.

8. The method according to any preceding claim, characterized in that said introduction of seeds occurs by depositing a layer of seeds.

9. The method according to any preceding claim, characterized in that said nondestructive drying reduces the percentage of humidity in the seeding bed to the point at which seed germination is no longer possible and tends to preserve the possibility of rapid future revival of microorganisms activity without degrading the natural and chemical organic substances present in the seeding bed.

10. The method according to any preceding claim 1 to 8, characterized in that said drying is performed by exposure in a ventilated greenhouse.

11. The method according to any preceding claim 1 to 8, characterized in that said drying is provided by means of low-temperature heat sources and by air change.

12. The method according to claim 3, characterized in that said cohesion treatment is performed by adding a bonding agent during mixing.

13. The method according to any claim 1 to 11, characterized in that said cohesion treatment is performed by laying a layer of adhesive on the entire outer surface of said sod.

14. A sod for cultivating plants, obtained with the method according to any preceding claim, comprising a seeded seeding bed including a fertilizer and wrapped or at least held together by a suitable organic bonding agent so as to maintain its shape.

15. The sod according to claim 14, characterized in that said bonding agent is biodegradable.

16. The sod according to claim 14, characterized in that said bonding agent comprises at least one colloidal substance.

17. The sod according to claim 16, characterized in that said bonding agent comprises glue of vegetable or animal origin.

18. The sod according to any claim 14 to 17, characterized in that said seeding bed comprises soil which includes mineral substances and at least one organic substance.

19. The sod according to claim 18, characterized in that said organic substance comprises one or more fertilizers.

20. The sod according to claim 18 or 19, characterized in that it comprises one or more selective herbicides which hinder the germination and growth of plants which are

different from, and antagonists of, those whose growth is sought.

21. The sod according to any one of the preceding claims 14 to 20, characterized in that it has a geometric shape which makes it possible to cover continuously the surface to be revegetated.

Prior art document WO 98/56232 discloses a plant seed germination method as claimed in the preamble of claim 1.

Disclosure of the Invention

The main object of the present invention is to provide a sod for forming lawns or other cultivations, which can be stored for a long time in environmental conditions without problems, so that it can be produced all over the year with no interruption.

Another object of the present invention is to provide a method for producing sods and for providing lawns, which is extremely simple to carry out.

According to a first aspect of the present invention, there is provided a method of preparing a plant cultivation, particularly a lawn, as defined in the appended claims,

Advantageously, after drying the sod can be packaged in a packaging material for storage and transport purposes.

According to another aspect of the present invention, there is provided a sod for cultivating plants, which comprises a seeded seeding bed which may have already received an addition of fertilizer and a suitable bonding agent for maintaining the parallelepiped-like shape given to it.

Brief description of the drawings

Further characteristics and advantages of the invention will become better apparent from the detailed description of some non-exclusive

PATENT COOPERATION TREATY

6

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NOTIFICATION OF THE INTERNATIONAL APPLICATION NUMBER AND OF THE INTERNATIONAL FILING DATE

(PCT Rule 20.5(c))

To:
Modiano, Guido
MODIANO & ASSOCIATI
Via Meravigli, 16
I-20123 Milano
ITALIE

Date of mailing *(day/month/year)*	04 04 2000
Applicant's or agent's file reference: 33190/GM/ch	IMPORTANT NOTIFICATION

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP 00/01476	23/02/2000	24/02/1999

Applicant: ZENTI MAXIMILIANO

Title of the invention:

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2. The applicant is further notified that the record copy of the international application was transmitted to the International Bureau on the above date of mailing.
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REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

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PCT/EP 00/01476
International Application No.

(23.02.2000) 23 FEB 2000
International Filing Date

EUROPEAN PATENT OFFICE
PCT INTERNATIONAL APPLICATION
Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum) 33190/GM/ch

Box No. I TITLE OF INVENTION

SOD COMPRISING AGRICULTURAL COMPONENTS PARTICULARLY FOR FORMING LAWNS, AND METHOD FOR PRODUCING IT

Box No. II APPLICANT

Name and address: *(Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

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[XX] This person is also inventor.

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Facsimile No.

Teleprinter No.

State *(that is, country)* of nationality: IT

State *(that is, country)* of residence: IT

This person is applicant for the purposes of: [X] all designated States [ ] all designated States except the United States of America [ ] the United States of America only [ ] the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: *(Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

This person is:
[ ] applicant only
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The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: [X] agent [ ] common representative

Name and address: *(Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country.)*

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Teleprinter No.

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PCT/EP00/01476

Box No. VI PRIORITY CL[illegible] ☐ Further priority claims are indicated in the Supplemental Box.

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is: national application: country	regional application:* regional Office	international application: receiving Office
item (1) 24 February 1999 (24.2.1999)	VR99A000021	IT		
item (2)				
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This international application contains the following **number of sheets**:

request	:	3
description (excluding sequence listing part)	:	11
claims	:	3
abstract	:	1
drawings	:	2
sequence listing part of description	:	
Total number of sheets	:	20

This international application is **accompanied** by the item(s) marked below:

1. ☐ fee calculation sheet
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Figure of the drawings which should accompany the abstract: 2

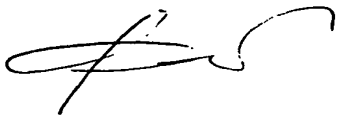
Language of filing of the international application: English

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

Milan, Italy
February 22, 2000

MODIANO Guido



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(71)(72) Applicant and Inventor: ZENTI, Maximiliano [IT/IT]; Via dell'Abaco, 20, I–37024 Negrar (IT).

(74) Agent: MODIANO, Guido; Modiano & Associati, Via Meravigli, 16, I–20123 Milano (IT).

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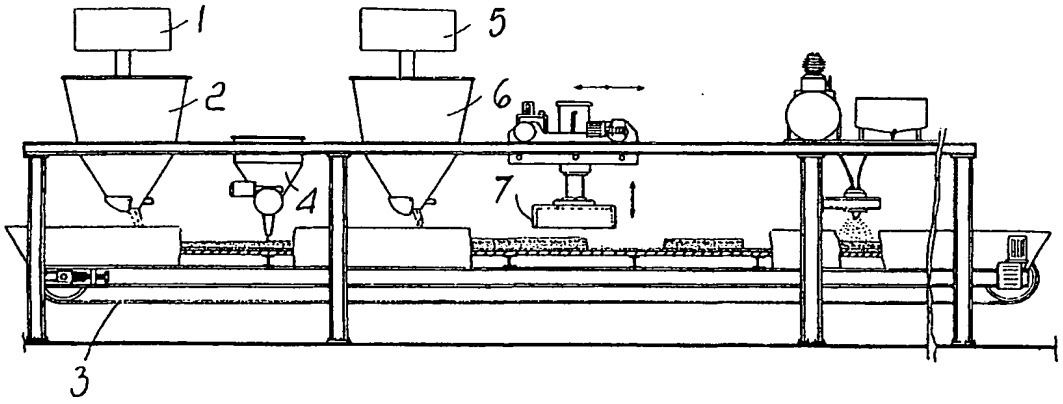
(54) Title: SOD COMPRISING AGRICULTURAL COMPONENTS PARTICULARLY FOR FORMING LAWNS, AND METHOD FOR PRODUCING IT



(57) Abstract

A sod of cultivation soil, complete with lawn grass seeds, fertilizers, selective herbicide and a bonding agent for the cohesion of the various elements contained therein. The sod has the conventional geometric shapes of paving tiles and allows to cover continuously, i.e. without gaps, the soil to be revegetated. A method for producing the sod makes it possible to store it and subsequent reuse it while obtaining optimum and rapid growth, of lawns, grassy layers, flowers and the like.

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SOD COMPRISING AGRICULTURAL COMPONENTS PARTICULARLY FOR FORMING LAWNS, AND METHOD FOR PRODUCING IT

Technical Field

The present invention relates to the production of a modular sod of cultivation soil which comprises all the components and ingredients required for preservation, subsequent laying, germination and growth of grassy species, such as grasses, for forming lawns and grassy layers or for growing other plants, said sod being particularly useful both in professional and hobby gardening.

Background art

Traditionally, lawns and grassy layers not for agricultural use are usually formed by the following steps.

First of all, a subsoil is prepared by clearing the area away of rocks, rubble, waste, shrubs and weeds, tilling the soil from a minimum of 15 cm to a maximum of 150 cm of depth, performing thorough fertilization with organic fertilizers and phosphate and potassium fertilizers, and providing drainage systems which make use of sand, gravel and optionally deeply buried pipes, leveling and rolling the entire surface.

This preparation of the subsoil is common for all lawns, although there are variations depending on whether an ornamental lawn or a sports field is to be provided.

Two methods, seeding and sodding, are currently used in order to cover the soil thus prepared with a layer of grass. Sodding consists in laying grass sods previously cultivated elsewhere, whereas with seeding the grass is grown entirely on-site.

These two methods of seeding and sodding necessarily entail particular care.

Seeding must be performed only in certain periods of the year at suitable adequate temperatures. At latitudes of northern Italy, for example, seeding is

performed between mid-March and mid-October. In order to have a more moist soil and avoid the presence of rhizomes of weeds, seeding is preferably performed between the end of summer and the beginning of autumn.

Seeding must be performed by uniformly scattering seeds on the surface and at a correct surface density, and thus it is almost always necessary to resort to seeding machines or to an expert sower when seeding is performed manually, as is usually the case for small areas.

After distributing the seeds, said seeds must be covered with a thin layer of earth and peat and the soil is rolled in order to ensure adhesion of the seed to the soil. These operations must be performed unless seeding is performed by casting a mixture of seeds, bonding agent and sawdust, e.g. on the slopes.

Subsequently, erosion of the topsoil due to rain and infestation caused by weed seeds may occur.

After seeding, the soil must be watered regularly for several months.

Sodding is a much faster revegetation method with lower weed invasion and no surface erosion and soil subsidence in case of rain. However, the varieties of grasses suitable for the sodding method are limited. Moreover, it is necessary to have wide areas available and suitable procedures for cultivating the grass on the sods must be followed.

Grassy sods, which are generally 4 or 5 mm thick, are uprooted, optionally rolled up, transported and laid on the final soil, and all this must occur in no more than one-and-a-half days, unless the sods are climate-controlled.

Before the sods are laid, one must ensure that the soil is soft, moist and rich in organic substances. After laying, gentle rolling is performed in order to ensure adequate contact with the soil, and any gaps between the sods are filled with sand and peat. Regular watering in the weeks after laying is also important.

Disclosure of the Invention

The main object of the present invention is to provide a sod for forming lawns or other cultivations, which can be stored for a long time in environmental conditions without problems, so that it can be produced all over the year with no interruption.

Another object of the present invention is to provide a method for producing sods and for providing lawns, which is extremely simple to carry out.

According to a first aspect of the present invention, there is provided a method of preparing a plant cultivation, particularly a lawn, characterized in that it comprises, also in a different time sequence, the following operating steps:

-- preparing a seeding bed and introducing seeds therein;

-- dividing the seeding bed into sods;

-- cohesion treatment, whereby the resulting sod is not brittle, makes it possible to maintain a geometric shape and allows proper handling until the laying step is completed;

-- nondestructive drying of the sod;

-- laying the sod and

-- moistening the sod before or after laying and regular watering afterwards.

Advantageously, after drying the sod can be packaged in a packaging material for storage and transport purposes.

According to another aspect of the present invention, there is provided a sod for cultivating plants, which comprises a seeded seeding bed which may have already received an addition of fertilizer and a suitable bonding agent for maintaining the parallelepiped-like shape given to it.

Brief description of the drawings

Further characteristics and advantages of the invention will become better apparent from the detailed description of some non-exclusive

embodiments thereof, illustrated only by way of non-limitative examples in the accompanying drawings, wherein:

Figures 1 and 2 shows each a schematic view of the procedure for obtaining sods according to the invention, and

Figure 3 is a perspective partial view of a store where sods obtained according to the invention are preserved.

Ways of carrying out the invention

Example 1

A lawn was provided in a shaded area of a home garden and parts of this area were decorated with jewelweeds - see Figure 1 of the drawings.

In order to provide a grassy layer, a mixer 1 was first used to mix the following components so as to obtain a granular mix:

-- 80-90% by volume of inert silica sand

-- 10-20% by volume of peat

-- potato starch as natural bonding agent

The mix was poured into a hopper 2 and from there it was deposited onto a conveyor belt 3 so as to form a non-interrupted layer of 1.5 to 8 cm.

Further along the path, the seeding machine 4 deposited onto the layer, carried by the conveyor belt 3, the mixture of seeds of the following species:

-- 15% Agrostis tennis

-- 30% Festuca ovina

-- 15% Festuca rubra commutata

-- 20% Poa nemoralis

-- 20% Poa pratensis

Inside the mixer 5, instead, a very rich mixture of fertilizer was prepared which also contained herbicide according to the following components: inert silica sand, peat, fertilizer providing slow release of nitrogenous substances, with phosphate and potassium, dicotyledon-selective herbicide, potato starch as natural bonding agent.

The preparation was fed beneath the hopper 6, from where it was poured

onto the conveyor belt, so as to form a 1/2-cm layer of soil which covered the seeds deposited earlier.

Through a press 7, the stratified mixture was die-cut or extruded through an extrusion die in order to form tiles, for example hexagonal in shape, measuring approximately 1.5 to 8 cm in thickness.

Instead of extruding the tiles at the end, it is possible to deposit successive layers in suitable molds in reverse order with respect to that of the above description. The mixture can be settled by means of vibrations imparted to the mold and left to rest for a short time, so that the bonding agent begins to bond. Finally, by turning over the molds, the seeds, the fertilizer and the herbicide lie directly below the surface of the tile.

The seeds were placed near the surface since that is their natural level, from which, after moistening, in the appropriate season and at suitable temperature, the bud will emerge promptly. The herbicide is useful only if it is located close to the surface in order to hinder germination of weed seeds carried by the wind or other carriers. A chemical fertilizer also was placed at a high level in order to be near the seeds, since due to watering it tends to percolate downwards, where there are no roots as they are not formed yet.

The chemical fertilizer is the first nutritional substance which provides minerals to the buds, even because said buds may not be formed straightaway and microorganisms and bacteria responsible for decomposition of any organic material may not be immediately available or become fully active.

In order to continuously cover the surface to be revegetated, it is possible in particular to use sods having geometric shapes which are commonly used for floor tiles, i.e. polygonal shapes, such as squares, rectangles and regular hexagons, octagons and triangles. Among these, however, preference is given to squares and rectangles for packaging and storing reasons. The hexagon has the advantage of having obtuse angles and therefore somewhat less brittle corners.

Potato starch was used as a bonding agent in this example, but as an alternative it is generally possible to use bonding agents obtained from plants (starches, fecula, flours, cellulose derivatives) or from animal tissues (fish glue, bone glue, skin glue), so long as they are biodegradable. Preferably bonding agents based on synthetic polymers are not used.

The bonding agent and other colloidal substances, such as humus and clay, cause the final structure of the resulting sod to be an aggregate of glomerules, whereby adequate porosity of the soil is ultimately obtained. The porosity involves micropores inside the glomerules, which are useful for future absorption of water, and macropores between the glomerules, which are useful for air circulation that is also very important for the roots. Porosity of the sod may also assist in drawing, by capillary action, water from subsoil in case of accidental lack of watering.

The formed tiles, carried by the conveyor belt 3 or by a second conveyor belt (not shown in the drawings), were laid in a store 10 provided with apertures to ensure ventilation, where the starch is set, thereby obtaining a suitable loss of moisture before packaging. Instead of a greenhouse, it is possible to use any source of heat at low temperature or any other dehumidification system. The same can also be done beforehand with the various materials before being mixed, although there is a higher risk of them being infested by weed seeds and spores and thus it is convenient to use dry materials which are possibly appropriately packaged. It is important that the components of the mixture and particularly the bonding agent do not release too much moisture to the seeds in the steps before dehumidification.

The tiles were then packaged under vacuum with impermeable films and stored.

After several months, they were transported to the laying site, where a subsoil had been prepared which consisted simply of 5 to 25 cm of growing medium on a main gravel layer with good permeability. The subsoil must of course have a surface which is arranged according to a final contour to be

achieved and must then be prepared so as to form the desired flat areas, elevations and depressions.

The tiles were laid at the end of March and watered with 5 liters of water per square meter every day in the early hours of the morning until the grass emerged. Subsequent watering was less frequent but more abundant, thus maintaining the average amount of water supplied. Once the tiles were removed from the packages, placed on the ground and moistened, the natural physical and biochemical phenomena of the soil were triggered. The slow-release fertilizer began to release its mineral salts into the solving water. Bacterial species taking part in nitrogen cycle transformations began to form and become active. In addition to other types of bacteria, many microorganisms such as algae, actinomycetes, protozoa were also formed, not to mention the many higher species. All these living beings contribute to the formation of humus and mineral substances, the decomposition of organic matter and bonding agent, the aggregation of particles and the churning of the soil.

If it is required to obtain grass bud quickly, one can perforate the impermeable packagings and moisten the tiles even before they are transported and laid, so as to activate their biochemical activity immediately.

The tiles have relatively precise geometric dimensions, so that no gaps remain between them during laying. However, if laying is executed in a hurry or there are sudden variations in level (steep elevations and depressions) and gaps are delimited between the tiles, the gaps can be filled with sand. This is useful, even because in laid-on gardens it is advisable to periodically perform more or less dense corings in the soil and fill the resulting holes with sand or sand mixed with peat. This operation, which is commonly performed on golf greens or sports fields, is known as aeration followed by plugging and is designed to eliminate compacting of the soil, to increase the percentage of macropores, to assist root growth, and to improve

microbiological activity and permeability to water.

It was found to be easy and creative to form flowerbeds including colorful floral patterns by alternating the tiles that formed the grassy sods described above with others which contained seeds of impatiens, which thrive in shaded areas and are suitable for forming borders and patches. Said tiles had been produced with the above described process and had the following composition:

-- soil composed of 1/3 sand, 1/3 clay and silt, 1/3 peat and amendments obtained from biocomposting;

-- fertilizer constituted by algae extract;

-- fish glue as natural bonding agent;

-- selective herbicide for monocotyledons;

-- seeds of perennial Impatiens Walleriana (impatiens).

The tiles can be colored on the surface with a harmless dye which makes it possible to distinguish them according to their type and to visualize them better during laying, when patterns are to be formed.

The tiles at the borders of the lawn or at the borders of the flowerbeds can be cut, if necessary, in order to obtain the right size and follow the border, especially in the case of lawns with curvilinear edges.

Example 2

Reference should be made to Figure 2 for this example.

A sports playing field according to DIN standards was provided by forming the entire cultivation medium by means of transportable blocks. Only the drainage system and, above it, a layer of 10-15 cm of fine gravel were prepared on-site.

The blocks were again produced by means of a conveyor belt on which hoppers dropped their contents in successive locations.

A hopper 2 contained a mixture of dry sands, dry-mixed beforehand by a mixer 1, so as to produce soil having the following grading:

-- maximum content of particles having a diameter of 0.02 mm: 10% by

weight;

-- maximum content of particles having a diameter of 0.06 mm: 18% by weight;

-- maximum content of granules having a diameter of 4 mm: 15% by weight;

-- maximum diameter of the contained granules: 8 mm

The hopper 2 poured a 2-cm layer of this soil onto a conveyor belt 3.

Immediately thereafter, a seeding machine 4 planted at an appropriate depth the following mixture of seeds:

-- 50-60% of 2 different varieties of Lolium perenne;

-- the remaining 50-40% of 3 different varieties of Poa pratensis.

This was followed by a hopper 5 which deposited chemical fertilizer and, in a downward location, a hopper 6 which deposited selective herbicide.

The layer thus obtained was then divided into blocks shaped like a parallelepiped by a die-cutter 7.

The blocks were then immersed in a tank 8, which contained a natural bonding agent which adhered, forming a layer on the entire outer surface, and while setting wrapped and protected the block, which would otherwise have been rather brittle. The same compacting can be achieved by spraying bonding agent onto the sods within a suitable chamber.

The block covered by set bonding agent, if kept dry, did preserve itself for a long time without using impermeable enclosures, whereas once it was laid and regularly watered the natural bonding agent dissolved and rapidly degraded, leaving the block free.

By placing the blocks on a layer of gravel prepared on-site and by watering them systematically, the sports green developed normally.

The behavior of the sods illustrated in the above examples is simply that of carrying out natural biochemical and physical activities of the soil, already mentioned above in connection with the production processes.

The invention is susceptible of numerous modifications and variations,

all of which are to be considered as falling within the scope of the invention. Thus, for example, the invention can be used not only for generating a lawn or a grassy layer, but also for floral borders used on the edges of ornamental lawns or pillows, wisps and cascades of flowers in flowerbeds. The invention is particularly suitable for perennial flowers which easily reproduce by seeds.

The invention can also be applied to edible species, such as many vegetables, which reproduce well from dry-stored seeds.

Almost all vegetables, even bulky ones (for example pumpkins and egg-plants) can develop well in a few centimeters of thickness. One must also consider that some aromatic plants (such as basil and parsley) are not used in large amounts and require very little space and an extremely small amount of soil. The invention is therefore very convenient for anyone who wishes to make, for example, a "hanging kitchen-garden".

The invention can also be used with inferior plants, such as the subkingdom Thallophyta and for mushroom cultivation.

The invention is applicable to all kinds of reproduction in the plant kingdom: i.e. sexual reproduction, asexual reproduction and vegetative reproduction.

A number of definitions in the present specification are given hereafter for correct interpretation of the claims:

Seed: the term designates the reproductive germs of phanerogam cormophyte plants, but is used here with a necessarily broader meaning, extending it to the entire plant kingdom, and is meant to indicate these parts of the plants that are designed for their germination, whether derived from gamic, agamic or vegetative reproduction. These parts can therefore be constituted by seeds, spores, rhizomes, bulbs and bulbils, gems, tubers or parts thereof, fragments of branches or of other parts of the plant.

Seeding bed: a material, usually fertile soil, in which germination of plants and development of their underground parts are possible.

Texture or grading: the percentage ratio among the various solid particles of the soil, graded according to their dimensions. The graded parts of the soil are constituted by the skeleton and fine earth, which, in turn, comprises coarse sand, fine sand, silt and clay.

Structure and porosity: the concept given in the specification is repeated for the sake of clarity: colloidal substances such as humus and clay cause the structure of fertile soil to become an aggregation of glomerules rather than a compact mixture of components, so that one obtains an adequate porosity which is useful for the growth of plants. Said porosity is due to micropores, which are internal to the glomerules and useful for absorbing water, and to macropores between the glomerules that are useful for air circulation, which is a very important factor for the roots. The porosity of the sod can also assist in drawing, by capillary action, water from underground if watering is insufficient.

Organic substance: a substance comprising plant or animal residues in a more or less advanced state of decomposition. The substance can be already partially transformed by soil-dwelling organisms and microorganisms into elementary inorganic substances and humus.

The disclosures in Italian Patent Application No. VR99A000021 from which this application claims priority are incorporated herein by reference.

CLAIMS

1. A method of preparing a plant cultivation, particularly a lawn, characterized in that it comprises, also in a different time sequence, the following operating steps:

-- preparing a seeding bed and introducing seeds therein;

-- dividing the seeding bed into sods;

-- cohesion treatment, whereby the resulting sod is not brittle, makes it possible to maintain a geometric shape and allows proper handling until the laying step is completed;

-- nondestructive drying of the sod;

-- laying the sod and

-- moistening the sod before or after laying and regular watering afterwards.

2. The method according to claim 1, characterized in that after drying the sod is packaged in a suitable package for its preservation, storage and transport, preferably under vacuum.

3. The method according to claim 1 or 2, characterized in that said preparation of a seeding bed comprises the dosage of the components and the mixing thereof.

4. The method according to claim 1 or 2, characterized in that said preparation of a seeding bed is obtained by depositing successive layers of various components.

5. The method according to any preceding claim, characterized in that said division into sods occurs by molding the mix in a template, die or by extrusion in the chosen sod shape.

6. The method according to any claim 1 to 4, characterized in that said division into sods occurs by die-cutting.

7. The method according to any preceding claim, characterized in that said seed insertion occurs by implantation with a seeding machine.

8. The method according to any preceding claim, characterized in that

said introduction of seeds occurs by depositing a layer of seeds.

9. The method according to any preceding claim, characterized in that said nondestructive drying reduces the percentage of humidity in the seeding bed to the point at which seed germination is no longer possible and tends to preserve the possibility of rapid future revival of microorganisms activity without degrading the natural and chemical organic substances present in the seeding bed.

10. The method according to any preceding claim 1 to 8, characterized in that said drying is performed by exposure in a ventilated greenhouse.

11. The method according to any preceding claim 1 to 8, characterized in that said drying is provided by means of low-temperature heat sources and by air change.

12. The method according to any preceding claim, characterized in that said cohesion treatment is performed by adding a bonding agent during mixing.

13. The method according to any claim 1 to 11, characterized in that said cohesion treatment is performed by laying a layer of adhesive on the entire outer surface of said sod.

14. A sod for cultivating plants, obtained with the method according to any preceding claim, comprising a seeded seeding bed including a fertilizer and wrapped or at least held together by a suitable organic bonding agent so as to maintain its shape.

15. The sod according to claim 14, characterized in that it is non-polluting and suitable to avoid moisture from being transferred to the seeds in an amount sufficient to cause them to germinate.

16. The sod according to claim 15, characterized in that said bonding agent is biodegradable.

17. The sod according to claim 15 or 16, characterized in that said bonding agent comprises at least one colloidal substance.

18. The sod according to claim 15 or 16, characterized in that said

bonding agent comprises glue of vegetable or animal origin.

19. The sod according to any claim 14 to 18, characterized in that said seeding bed comprises soil which includes mineral substances and at least one organic substance.

20. The sod according to claim 19, characterized in that said organic substance comprises one or more fertilizers.

21. The sod according to claim 19 or 20, characterized in that it comprises one or more selective herbicides which hinder the germination and growth of plants which are different from, and antagonists of, those whose growth is sought.

22. The sod according to any one of the preceding claims 14 to 21, characterized in that it has a geometric shape which makes it possible to cover continuously the surface to be revegetated.

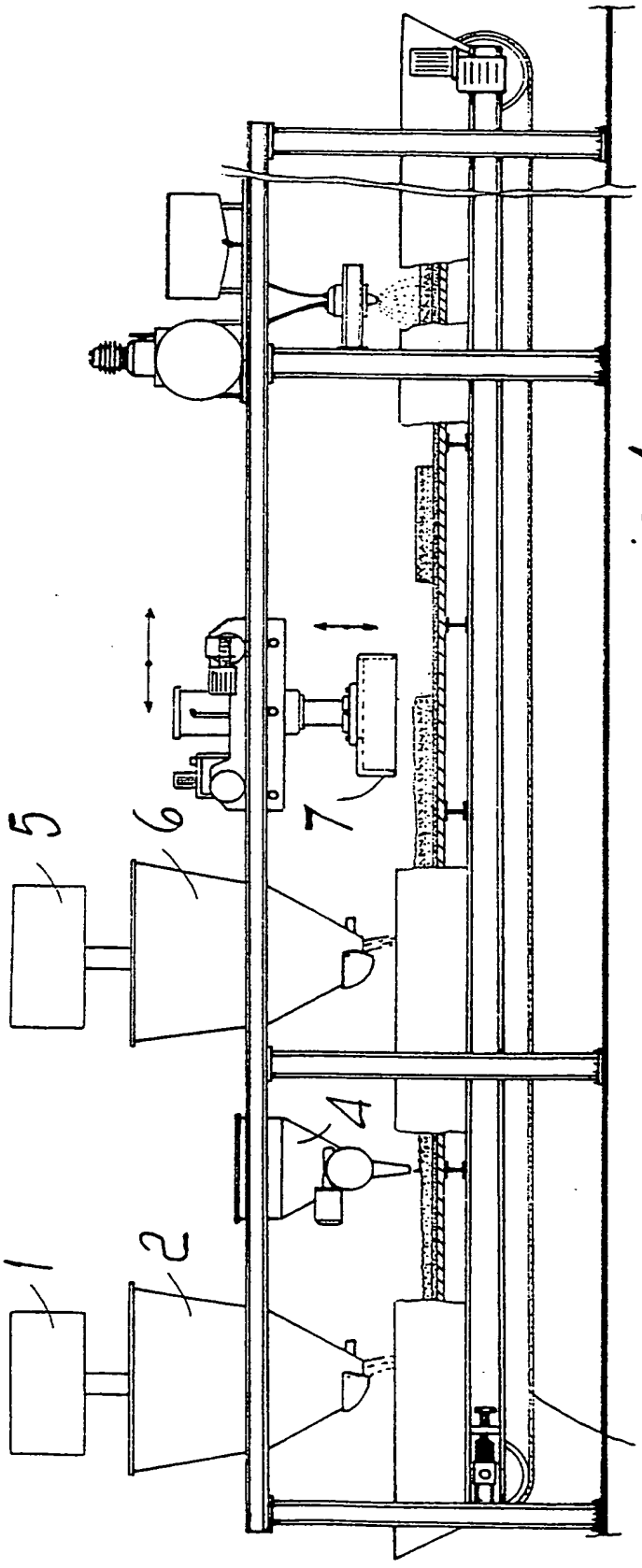


Fig. 1

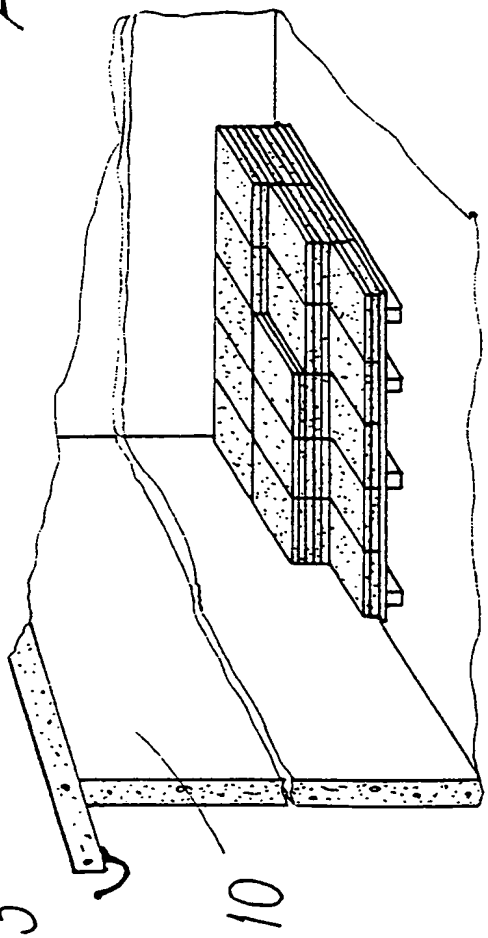
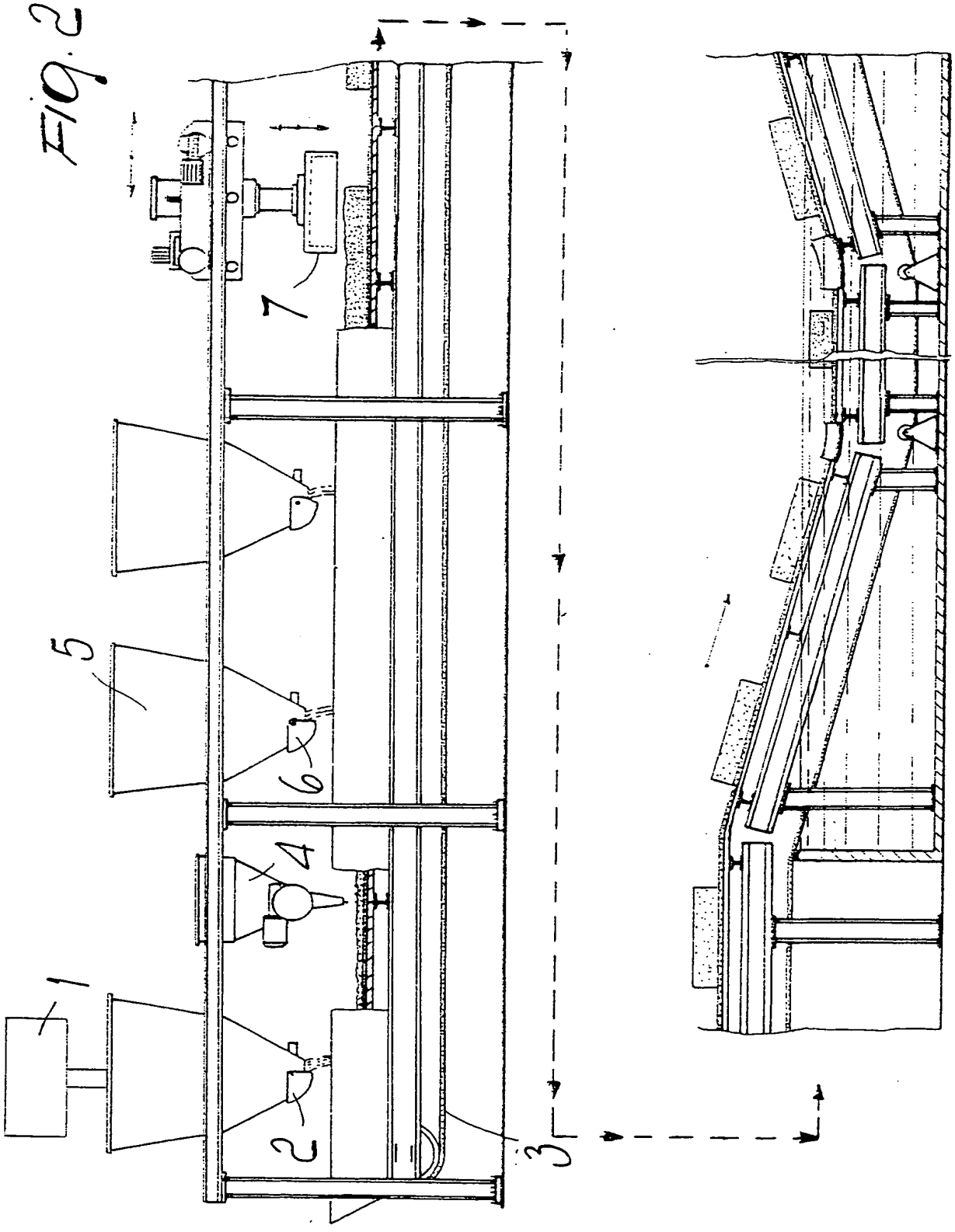


Fig. 3

Fig. 2



PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
33190/GM/ch		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/EP 00/ 01476	23/02/2000	24/02/1999
Applicant		
ZENTI, Maximiliano		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language,** the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 1

   [ ] as suggested by the applicant.

   [ ] because the applicant failed to suggest a figure.

   [X] because this figure better characterizes the invention.

   [ ] None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 00/01476

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A01G1/00 A01C1/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A01G A01C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 584 790 A (GAUGHEN THOMAS P) 29 April 1986 (1986-04-29) the whole document ---	1-9, 14-22
X	US 5 860 245 A (WELCH ROBIN LEE) 19 January 1999 (1999-01-19) column 2, line 5 - line 9 column 2, line 46 column 3, line 11 - line 15 column 3, line 65 - line 66 column 4, line 9 - line 14; figures --- -/--	1-4,8,9, 12,14-22

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 July 2000	18/07/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Fonts Cavestany, A

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 00/01476

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 56232 A (JOHNSON & JOHNSON INC ;LAGUEUX LUC (CA); DESJARDINS ALAIN (CA); PE) 17 December 1998 (1998-12-17) page 20, line 22 - line 26 page 22, line 1 - line 10 page 25, line 24 - line 28 page 26, line 19 page 26, line 24 - line 29; figures	1,4-9, 11,14-22
A	US 4 786 550 A (MCFARLAND TIMOTHY M ET AL) 22 November 1988 (1988-11-22) the whole document	1-22
A	US 4 414 776 A (BALL HARRY J) 15 November 1983 (1983-11-15) claims; figures	1-22

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

information on patent family members

Inter. Application No
PCT/EP 00/01476

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4584790 A	29-04-1986	AU 4909585 A	15-05-1986
US 5860245 A	19-01-1999	NONE	
WO 9856232 A	17-12-1998	CA 2207227 A	09-12-1998
		AU 7754998 A	30-12-1998
US 4786550 A	22-11-1988	AU 4113389 A	14-12-1989
		AU 590881 B	23-11-1989
		AU 5711186 A	13-11-1986
		EP 0201087 A	12-11-1986
		JP 61254105 A	11-11-1986
US 4414776 A	15-11-1983	US 4357780 A	09-11-1982

(8)

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

To:
MODIANO & ASSOCIATI
Attn. Modiano, Guido
Via Meravigli, 16
I-20123 Milano
ITALY

Date of mailing *(day/month/year)*	18/07/2000
Applicant's or agent's file reference: 33190/GM/ch	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No.: PCT/EP 00/01476	International filing date *(day/month/year)* 23/02/2000
Applicant: ZENTI, Maximiliano	

1. [X] The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Fascimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. [ ] The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. [ ] **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

[ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

[ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Louis Kainde

Form PCT/ISA/220 (July 1998)

2 pgs

USED THE PUBLISHED APPLICATION IN PLACE OF THIS COPY SUBMITTED BY THE APPLICANT.

APPLICATION

FOR

UNITED STATES OF AMERICA

* *

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

Be it known that I,

Maximiliano ZENTI
Italian citizen
of NEGRAR – ITALY

have invented certain improvements in

"SOD COMPRISING AGRICULTURAL COMPONENTS PARTICULARLY FOR FORMING LAWNS, AND METHOD FOR PRODUCING IT"

of which the following description in connection with the accompanying drawings is a specification, like reference characters on the drawings indicating like parts in the several figures.

BACKGROUND OF THE INVENTION

The present invention relates to the production of a modular sod of cultivation soil which comprises all the components and ingredients required for preservation, subsequent laying, germination and growth of grassy species, such as grasses, for forming lawns and grassy layers or for growing other plants, said sod being particularly useful both in professional and hobby gardening.

Traditionally, lawns and grassy layers not for agricultural use are usually formed by the following steps.

First of all, a subsoil is prepared by clearing the area away of rocks, rubble, waste, shrubs and weeds, tilling the soil from a minimum of 15 cm to a maximum of 150 cm of depth, performing thorough fertilization with organic fertilizers and phosphate and potassium fertilizers, and providing drainage systems which make use of sand, gravel and optionally deeply buried pipes, leveling and rolling the entire surface.

This preparation of the subsoil is common for all lawns, although there are variations depending on whether an ornamental lawn or a sports field is to be provided.

Two methods, seeding and sodding, are currently used in order to cover the soil thus prepared with a layer of grass. Sodding consists in laying grass sods previously cultivated elsewhere, whereas with seeding the grass is grown entirely on-site.

These two methods of seeding and sodding necessarily entail particular care.

Seeding must be performed only in certain periods of the year at suitable adequate temperatures. At latitudes of northern Italy, for example, seeding is performed between mid-March and mid-October. In order to have a more moist soil and avoid the presence of rhizomes of weeds, seeding is preferably performed between the end of summer and the beginning of autumn.

Seeding must be performed by uniformly scattering seeds on the surface and at a correct surface density, and thus it is almost always necessary to resort to seeding machines or to an expert sower when seeding is performed manually, as is usually the case for small areas.

After distributing the seeds, said seeds must be covered with a thin layer of earth and peat and the soil is rolled in order to ensure adhesion of the seed to the soil. These operations must be performed unless seeding is performed by casting a mixture of seeds, bonding agent and sawdust, e.g. on the slopes.

Subsequently, erosion of the topsoil due to rain and infestation caused by weed seeds may occur.

After seeding, the soil must be watered regularly for several months.

Sodding is a much faster revegetation method with lower weed invasion and no surface erosion and soil subsidence in case of rain. However, the varieties of grasses suitable for the sodding method are limited. Moreover, it is necessary to have wide areas available and suitable procedures for cultivating the grass on the sods must be followed.

Grassy sods, which are generally 4 or 5 mm thick, are uprooted, optionally rolled up, transported and laid on the final soil, and all this must occur in no more than one-and-a-half days, unless the sods are climate-controlled.

Before the sods are laid, one must ensure that the soil is soft, moist and rich in organic substances. After laying, gentle rolling is performed in order to ensure adequate contact with the soil, and any gaps between the sods are filled with sand and peat. Regular watering in the weeks after laying is also important.

Prior art document WO 98/56232 discloses a plant seed germination method as claimed in the preamble of claim 1.

SUMMARY OF THE INVENTION

The main object of the present invention is to provide a sod for forming

lawns or other cultivations, which can be stored for a long time in environmental conditions without problems, so that it can be produced all over the year with no interruption.

Another object of the present invention is to provide a method for producing sods and for providing lawns, which is extremely simple to carry out.

According to a first aspect of the present invention, there is provided a method of preparing a plant cultivation, particularly a lawn, as defined in the appended claims.

Advantageously, after drying the sod can be packaged in a packaging material for storage and transport purposes.

According to another aspect of the present invention, there is provided a sod for cultivating plants, which comprises a seeded seeding bed which may have already received an addition of fertilizer and a suitable bonding agent for maintaining the parallelepiped-like shape given to it.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the invention will become better apparent from the detailed description of some non-exclusive embodiments thereof, illustrated only by way of non-limitative examples in the accompanying drawings, wherein:

Figures 1 and 2 shows each a schematic view of the procedure for obtaining sods according to the invention, and

Figure 3 is a perspective partial view of a store where sods obtained according to the invention are preserved.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Example 1

A lawn was provided in a shaded area of a home garden and parts of this area were decorated with jewelweeds - see Figure 1 of the drawings.

In order to provide a grassy layer, a mixer 1 was first used to mix the following components so as to obtain a granular mix:

-- 80-90% by volume of inert silica sand

-- 10-20% by volume of peat

-- potato starch as natural bonding agent

The mix was poured into a hopper 2 and from there it was deposited onto a conveyor belt 3 so as to form a non-interrupted layer of 1.5 to 8 cm.

Further along the path, the seeding machine 4 deposited onto the layer, carried by the conveyor belt 3, the mixture of seeds of the following species:

-- 15% Agrostis tennis

-- 30% Festuca ovina

-- 15% Festuca rubra commutata

-- 20% Poa nemoralis

-- 20% Poa pratensis

Inside the mixer 5, instead, a very rich mixture of fertilizer was prepared which also contained herbicide according to the following components: inert silica sand, peat, fertilizer providing slow release of nitrogenous substances, with phosphate and potassium, dicotyledon-selective herbicide, potato starch as natural bonding agent.

The preparation was fed beneath the hopper 6, from where it was poured onto the conveyor belt, so as to form a 1/2-cm layer of soil which covered the seeds deposited earlier.

Through a press 7, the stratified mixture was die-cut or extruded through an extrusion die in order to form tiles, for example hexagonal in shape, measuring approximately 1.5 to 8 cm in thickness.

Instead of extruding the tiles at the end, it is possible to deposit successive layers in suitable molds in reverse order with respect to that of the above description. The mixture can be settled by means of vibrations imparted to the mold and left to rest for a short time, so that the bonding agent begins to bond. Finally, by turning over the molds, the seeds, the fertilizer and the herbicide lie directly below the surface of the tile.

The seeds were placed near the surface since that is their natural level,

from which, after moistening, in the appropriate season and at suitable temperature, the bud will emerge promptly. The herbicide is useful only if it is located close to the surface in order to hinder germination of weed seeds carried by the wind or other carriers. A chemical fertilizer also was placed at a high level in order to be near the seeds, since due to watering it tends to percolate downwards, where there are no roots as they are not formed yet.

The chemical fertilizer is the first nutritional substance which provides minerals to the buds, even because said buds may not be formed straightaway and microorganisms and bacteria responsible for decomposition of any organic material may not be immediately available or become fully active.

In order to continuously cover the surface to be revegetated, it is possible in particular to use sods having geometric shapes which are commonly used for floor tiles, i.e. polygonal shapes, such as squares, rectangles and regular hexagons, octagons and triangles. Among these, however, preference is given to squares and rectangles for packaging and storing reasons. The hexagon has the advantage of having obtuse angles and therefore somewhat less brittle corners.

Potato starch was used as a bonding agent in this example, but as an alternative it is generally possible to use bonding agents obtained from plants (starches, fecula, flours, cellulose derivatives) or from animal tissues (fish glue, bone glue, skin glue), so long as they are biodegradable. Preferably bonding agents based on synthetic polymers are not used.

The bonding agent and other colloidal substances, such as humus and clay, cause the final structure of the resulting sod to be an aggregate of glomerules, whereby adequate porosity of the soil is ultimately obtained. The porosity involves micropores inside the glomerules, which are useful for future absorption of water, and macropores between the glomerules, which are useful for air circulation that is also very important for the roots. Porosity of the sod may also assist in drawing, by capillary action, water

from subsoil in case of accidental lack of watering.

The formed tiles, carried by the conveyor belt 3 or by a second conveyor belt (not shown in the drawings), were laid in a store 10 provided with apertures to ensure ventilation, where the starch is set, thereby obtaining a suitable loss of moisture before packaging. Instead of a greenhouse, it is possible to use any source of heat at low temperature or any other dehumidification system. The same can also be done beforehand with the various materials before being mixed, although there is a higher risk of them being infested by weed seeds and spores and thus it is convenient to use dry materials which are possibly appropriately packaged. It is important that the components of the mixture and particularly the bonding agent do not release too much moisture to the seeds in the steps before dehumidification.

The tiles were then packaged under vacuum with impermeable films and stored.

After several months, they were transported to the laying site, where a subsoil had been prepared which consisted simply of 5 to 25 cm of growing medium on a main gravel layer with good permeability. The subsoil must of course have a surface which is arranged according to a final contour to be achieved and must then be prepared so as to form the desired flat areas, elevations and depressions.

The tiles were laid at the end of March and watered with 5 liters of water per square meter every day in the early hours of the morning until the grass emerged. Subsequent watering was less frequent but more abundant, thus maintaining the average amount of water supplied. Once the tiles were removed from the packages, placed on the ground and moistened, the natural physical and biochemical phenomena of the soil were triggered. The slow-release fertilizer began to release its mineral salts into the solving water. Bacterial species taking part in nitrogen cycle transformations began to form and become active. In addition to other types of bacteria, many microorganisms such as algae, actinomycetes, protozoa were also formed,

not to mention the many higher species. All these living beings contribute to the formation of humus and mineral substances, the decomposition of organic matter and bonding agent, the aggregation of particles and the churning of the soil.

If it is required to obtain grass bud quickly, one can perforate the impermeable packagings and moisten the tiles even before they are transported and laid, so as to activate their biochemical activity immediately.

The tiles have relatively precise geometric dimensions, so that no gaps remain between them during laying. However, if laying is executed in a hurry or there are sudden variations in level (steep elevations and depressions) and gaps are delimited between the tiles, the gaps can be filled with sand. This is useful, even because in laid-on gardens it is advisable to periodically perform more or less dense corings in the soil and fill the resulting holes with sand or sand mixed with peat. This operation, which is commonly performed on golf greens or sports fields, is known as aeration followed by plugging and is designed to eliminate compacting of the soil, to increase the percentage of macropores, to assist root growth, and to improve microbiological activity and permeability to water.

It was found to be easy and creative to form flowerbeds including colorful floral patterns by alternating the tiles that formed the grassy sods described above with others which contained seeds of impatiens, which thrive in shaded areas and are suitable for forming borders and patches. Said tiles had been produced with the above described process and had the following composition:

-- soil composed of 1/3 sand, 1/3 clay and silt, 1/3 peat and amendments obtained from biocomposting;

-- fertilizer constituted by algae extract;

-- fish glue as natural bonding agent;

-- selective herbicide for monocotyledons;

-- seeds of perennial Impatiens Walleriana (impatiens).

The tiles can be colored on the surface with a harmless dye which makes it possible to distinguish them according to their type and to visualize them better during laying, when patterns are to be formed.

The tiles at the borders of the lawn or at the borders of the flowerbeds can be cut, if necessary, in order to obtain the right size and follow the border, especially in the case of lawns with curvilinear edges.

Example 2

Reference should be made to Figure 2 for this example.

A sports playing field according to DIN standards was provided by forming the entire cultivation medium by means of transportable blocks. Only the drainage system and, above it, a layer of 10-15 cm of fine gravel were prepared on-site.

The blocks were again produced by means of a conveyor belt on which hoppers dropped their contents in successive locations.

A hopper 2 contained a mixture of dry sands, dry-mixed beforehand by a mixer 1, so as to produce soil having the following grading:

-- maximum content of particles having a diameter of 0.02 mm: 10% by weight;

-- maximum content of particles having a diameter of 0.06 mm: 18% by weight;

-- maximum content of granules having a diameter of 4 mm: 15% by weight;

-- maximum diameter of the contained granules: 8 mm

The hopper 2 poured a 2-cm layer of this soil onto a conveyor belt 3.

Immediately thereafter, a seeding machine 4 planted at an appropriate depth the following mixture of seeds:

-- 50-60% of 2 different varieties of Lolium perenne;

-- the remaining 50-40% of 3 different varieties of Poa pratensis.

This was followed by a hopper 5 which deposited chemical fertilizer and,

in a downward location, a hopper 6 which deposited selective herbicide.

The layer thus obtained was then divided into blocks shaped like a parallelepiped by a die-cutter 7.

The blocks were then immersed in a tank 8, which contained a natural bonding agent which adhered, forming a layer on the entire outer surface, and while setting wrapped and protected the block, which would otherwise have been rather brittle. The same compacting can be achieved by spraying bonding agent onto the sods within a suitable chamber.

The block covered by set bonding agent, if kept dry, did preserve itself for a long time without using impermeable enclosures, whereas once it was laid and regularly watered the natural bonding agent dissolved and rapidly degraded, leaving the block free.

By placing the blocks on a layer of gravel prepared on-site and by watering them systematically, the sports green developed normally.

The behavior of the sods illustrated in the above examples is simply that of carrying out natural biochemical and physical activities of the soil, already mentioned above in connection with the production processes.

The invention is susceptible of numerous modifications and variations, all of which are to be considered as falling within the scope of the invention. Thus, for example, the invention can be used not only for generating a lawn or a grassy layer, but also for floral borders used on the edges of ornamental lawns or pillows, wisps and cascades of flowers in flowerbeds. The invention is particularly suitable for perennial flowers which easily reproduce by seeds.

The invention can also be applied to edible species, such as many vegetables, which reproduce well from dry-stored seeds.

Almost all vegetables, even bulky ones (for example pumpkins and egg-plants) can develop well in a few centimeters of thickness. One must also consider that some aromatic plants (such as basil and parsley) are not used in large amounts and require very little space and an extremely small

amount of soil. The invention is therefore very convenient for anyone who wishes to make, for example, a "hanging kitchen-garden".

The invention can also be used with inferior plants, such as the subkingdom Thallophyta and for mushroom cultivation.

The invention is applicable to all kinds of reproduction in the plant kingdom: i.e. sexual reproduction, asexual reproduction and vegetative reproduction.

A number of definitions in the present specification are given hereafter for correct interpretation of the claims:

Seed: the term designates the reproductive germs of phanerogam cormophyte plants, but is used here with a necessarily broader meaning, extending it to the entire plant kingdom, and is meant to indicate these parts of the plants that are designed for their germination, whether derived from gamic, agamic or vegetative reproduction. These parts can therefore be constituted by seeds, spores, rhizomes, bulbs and bulbils, gems, tubers or parts thereof, fragments of branches or of other parts of the plant.

Seeding bed: a material, usually fertile soil, in which germination of plants and development of their underground parts are possible.

Texture or grading: the percentage ratio among the various solid particles of the soil, graded according to their dimensions. The graded parts of the soil are constituted by the skeleton and fine earth, which, in turn, comprises coarse sand, fine sand, silt and clay.

Structure and porosity: the concept given in the specification is repeated for the sake of clarity: colloidal substances such as humus and clay cause the structure of fertile soil to become an aggregation of glomerules rather than a compact mixture of components, so that one obtains an adequate porosity which is useful for the growth of plants. Said porosity is due to micropores, which are internal to the glomerules and useful for absorbing water, and to macropores between the glomerules that are useful for air circulation, which is a very important factor for the roots. The

porosity of the sod can also assist in drawing, by capillary action, water from underground if watering is insufficient.

Organic substance: a substance comprising plant or animal residues in a more or less advanced state of decomposition. The substance can be already partially transformed by soil-dwelling organisms and microorganisms into elementary inorganic substances and humus.

The disclosures in Italian Patent Application No. VR99A000021 from which this application claims priority are incorporated herein by reference.

CLAIMS

1. A method of preparing a plant cultivation, particularly a lawn, comprising, also in a different time sequence, the following operating steps:

-- preparing a seeding bed and introducing seeds therein;

-- dividing the seeding bed into sods;

-- cohesion treatment, whereby the resulting sod is not brittle, makes it possible to maintain a geometric shape and allows proper handling until the laying step is completed;

-- laying the sod and

-- moistening the sod before or after laying and regular watering afterwards, characterized in that said seeding bed is prepared using dry materials and before laying the sod a drying step is performed on the sod.

2. The method according to claim 1, characterized in that after drying the sod is packaged in a suitable package for its preservation, storage and transport, preferably under vacuum.

3. The method according to claim 1 or 2, characterized in that said preparation of a seeding bed comprises the dosage of the components and the mixing thereof.

4. The method according to claim 1 or 2, characterized in that said preparation of a seeding bed is obtained by depositing successive layers of various components.

5. The method according to any preceding claim, characterized in that said division into sods occurs by molding the mix in a template, die or by extrusion in the chosen sod shape.

6. The method according to any claim 1 to 4, characterized in that said division into sods occurs by die-cutting.

7. The method according to any preceding claim, characterized in that said seed insertion occurs by implantation with a seeding machine.

8. The method according to any preceding claim, characterized in that

said introduction of seeds occurs by depositing a layer of seeds.

9. The method according to any preceding claim, characterized in that said nondestructive drying reduces the percentage of humidity in the seeding bed to the point at which seed germination is no longer possible and tends to preserve the possibility of rapid future revival of microorganisms activity without degrading the natural and chemical organic substances present in the seeding bed.

10. The method according to any preceding claim 1 to 8, characterized in that said drying is performed by exposure in a ventilated greenhouse.

11. The method according to any preceding claim 1 to 8, characterized in that said drying is provided by means of low-temperature heat sources and by air change.

12. The method according to claim 3, characterized in that said cohesion treatment is performed by adding a bonding agent during mixing.

13. The method according to any claim 1 to 11, characterized in that said cohesion treatment is performed by laying a layer of adhesive on the entire outer surface of said sod.

14. A sod for cultivating plants, obtained with the method according to any preceding claim, comprising a seeded seeding bed including a fertilizer and wrapped or at least held together by a suitable organic bonding agent so as to maintain its shape.

15. The sod according to claim 14, characterized in that said bonding agent is biodegradable.

16. The sod according to claim 14, characterized in that said bonding agent comprises at least one colloidal substance.

17. The sod according to claim 16, characterized in that said bonding agent comprises glue of vegetable or animal origin.

18. The sod according to any claim 14 to 17, characterized in that said seeding bed comprises soil which includes mineral substances and at least one organic substance.

19. The sod according to claim 18, characterized in that said organic substance comprises one or more fertilizers.

20. The sod according to claim 18 or 19, characterized in that it comprises one or more selective herbicides which hinder the germination and growth of plants which are different from, and antagonists of, those whose growth is sought.

21. The sod according to any one of the preceding claims 14 to 20, characterized in that it has a geometric shape which makes it possible to cover continuously the surface to be revegetated.

SOD COMPRISING AGRICULTURAL COMPONENTS PARTICULARLY FOR FORMING LAWNS, AND METHOD FOR PRODUCING IT

ABSTRACT OF THE DISCLOSURE

A sod of cultivation soil, complete with lawn grass seeds, fertilizers, selective herbicide and a bonding agent for the cohesion of the various elements contained therein. The sod has the conventional geometric shapes of paving tiles and allows to cover continuously, i.e. without gaps, the soil to be revegetated. A method for producing the sod makes it possible to store it and subsequent reuse it while obtaining optimum and rapid growth, of lawns, grassy layers, flowers and the like.

(Figure 2)

CAPITALE SOCIALE L. 200.000.000 I.V. - VAT ID NO IT-02156280154 - COD. FISC. E P.IVA 02156280154 - REG. IMPR. 162658 - R.E.A. MILANO 900031

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23 April 2001

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Attn.: **BUNN, D. - Authorized Officer/Examiner**
SALAUN, M - Formalities Officer

Re: International application No. PCT/EP00/01476
filed on February 23, 2000
in the name of ZENTI Maximiliano
Our ref.: 33190/MEL/rf

Dear Sirs,

This is in response to the first Written Opinion dated November 24, 2000 drawn up by the International Preliminary Examining Authority, for which two-months extension of the time limit were requested and granted.

The Examiner's comments and objections and the cited prior art documents have been carefully considered.

Accordingly, a new set of claims 1-21, retyped in triplicate, is herewith enclosed for substitution of originally filed claims 1- 22. New description page 3, retyped in triplicate, is also herewith enclosed for substitution of originally filed description page 3.

The Examiner's objections are addressed below in the same order as presented in the Official Communication.

It is observed that the Examiner rejected claims 1-15 as being anticipated by WO-A-98 56232 (D1).

To this regard, it is to be submitted that one of the particular features of the invention, now introduced in new claim 1, is that tiles, in addition to, before being packaged, being laid in a store where apertures are provided in order to obtain a suitable loss of moisture, are formed using dry materials, as explained on page 6, lines 19-24 of the description.

This will guarantee that the components of the mixture do not release too much moisture to the seeds in the steps before the dehumidification.

This features has thus been introduced in the new claim 1 which is now believed to be both new and inventive over the cited prior art document.

In fact, D1 does not disclose a tile which is formed using "already" dry materials, in order to limit to a minimum the development of humidity.

In view of the above, reconsideration of the claims is respectfully requested.

The new claim 1 has been drafted in the two part form, wherein the above-described feature and the fact that a dehumidification step is performed are the characterizing features.

As clearly stated by the Examiner, no real drying step is performed in D1 and only the cohesion step is disclosed (which the Examiner believes necessarily including also a drying step), so that the dehumidification step of the applicant's invention has been maintained in the characterizing portion of the claim.

Prior art document D1 has been properly identified in the description and the relevant background art contained therein has been briefly discussed by reference to the preamble of claim 1.

Finally, the description has been brought in conformity with the new claims.

Reconsideration of the application is respectfully requested.

Respectfully submitted,

Guido Modiano
Authorized Representative

Encls: New claims 1-21, retpyed in triplicate;
New description page 3, retyped in triplicate.

CLAIMS

1. A method of preparing a plant cultivation, particularly a lawn, comprising, also in a different time sequence, the following operating steps:

-- preparing a seeding bed and introducing seeds therein;

-- dividing the seeding bed into sods;

-- cohesion treatment, whereby the resulting sod is not brittle, makes it possible to maintain a geometric shape and allows proper handling until the laying step is completed;

-- laying the sod and

-- moistening the sod before or after laying and regular watering afterwards, characterized in that said seeding bed is prepared using dry materials and before laying the sod a drying step is performed on the sod.

2. The method according to claim 1, characterized in that after drying the sod is packaged in a suitable package for its preservation, storage and transport, preferably under vacuum.

3. The method according to claim 1 or 2, characterized in that said preparation of a seeding bed comprises the dosage of the components and the mixing thereof.

4. The method according to claim 1 or 2, characterized in that said preparation of a seeding bed is obtained by depositing successive layers of various components.

5. The method according to any preceding claim, characterized in that said division into sods occurs by molding the mix in a template, die or by extrusion in the chosen sod shape.

6. The method according to any claim 1 to 4, characterized in that said division into sods occurs by die-cutting.

7. The method according to any preceding claim, characterized in that said seed insertion occurs by implantation with a seeding machine.

8. The method according to any preceding claim, characterized in that said introduction of seeds occurs by depositing a layer of seeds.

9. The method according to any preceding claim, characterized in that said nondestructive drying reduces the percentage of humidity in the seeding bed to the point at which seed germination is no longer possible and tends to preserve the possibility of rapid future revival of microorganisms activity without degrading the natural and chemical organic substances present in the seeding bed.

10. The method according to any preceding claim 1 to 8, characterized in that said drying is performed by exposure in a ventilated greenhouse.

11. The method according to any preceding claim 1 to 8, characterized in that said drying is provided by means of low-temperature heat sources and by air change.

12. The method according to claim 3, characterized in that said cohesion treatment is performed by adding a bonding agent during mixing.

13. The method according to any claim 1 to 11, characterized in that said cohesion treatment is performed by laying a layer of adhesive on the entire outer surface of said sod.

14. A sod for cultivating plants, obtained with the method according to any preceding claim, comprising a seeded seeding bed including a fertilizer and wrapped or at least held together by a suitable organic bonding agent so as to maintain its shape.

15. The sod according to claim 14, characterized in that said bonding agent is biodegradable.

16. The sod according to claim 14, characterized in that said bonding agent comprises at least one colloidal substance.

17. The sod according to claim 16, characterized in that said bonding agent comprises glue of vegetable or animal origin.

18. The sod according to any claim 14 to 17, characterized in that said seeding bed comprises soil which includes mineral substances and at least one organic substance.

19. The sod according to claim 18, characterized in that said organic substance comprises one or more fertilizers.

20. The sod according to claim 18 or 19, characterized in that it comprises one or more selective herbicides which hinder the germination and growth of plants which are

different from, and antagonists of, those whose growth is sought.

21. The sod according to any one of the preceding claims 14 to 20, characterized in that it has a geometric shape which makes it possible to cover continuously the surface to be revegetated.

Prior art document WO 98/56232 discloses a plant seed germination method as claimed in the preamble of claim 1.

Disclosure of the Invention

The main object of the present invention is to provide a sod for forming lawns or other cultivations, which can be stored for a long time in environmental conditions without problems, so that it can be produced all over the year with no interruption.

Another object of the present invention is to provide a method for producing sods and for providing lawns, which is extremely simple to carry out.

According to a first aspect of the present invention, there is provided a method of preparing a plant cultivation, particularly a lawn, as defined in the appended claims,

Advantageously, after drying the sod can be packaged in a packaging material for storage and transport purposes.

According to another aspect of the present invention, there is provided a sod for cultivating plants, which comprises a seeded seeding bed which may have already received an addition of fertilizer and a suitable bonding agent for maintaining the parallelepiped-like shape given to it.

Brief description of the drawings

Further characteristics and advantages of the invention will become better apparent from the detailed description of some non-exclusive

The demand must be filed directly with the competent International Preliminary Examining Authority. If two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

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PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:
The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA	Date of receipt of DEMAND

Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference
		33190/GM/cb
International application No.	International filing date *(day/month/year)*	(Earliest) Priority date *(day/month/year)*
PCT/EP00/01476	23 FEBRUARY 2000 (23.02.00)	24 FEBRUARY 1999 (24.02.99)
Title of invention	"SOD COMPRISING AGRICULTURAL COMPONENTS PARTICULARLY FOR FORMING LAWNS, AND METHOD FOR PRODUCING IT"	

Box No. II APPLICANT(S)

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*	Telephone No.:
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Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*	
State *(that is, country)* of nationality:	State *(that is, country)* of residence:

☐ Further applicants are indicated on a continuation sheet.

PATENT COOPERATION TREATY

13

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
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PCT

COMMUNICATION REGARDING EXTENSION OF TIME LIMIT

(PCT Rules 60.1(a) and 66.2(d))

Applicant's or agent's file reference: 33190/GM/ch	Date of mailing (day/month/year): 04.04.01
International application No.: PCT/EP 00/01476	IMPORTANT COMMUNICATION
Applicant: ZENTI, Maximiliano	International filing date (day/month/year): 23/02/2000

1. In response of the applicant's request of 30/03/01 BY PHONE, the time limit for replying to:
   - [X] the first written opinion of 24/11/2000
   - [ ] (other) _____

   has been extended as follows:
   - [X] extension of 1 month(s) XXX days
   - [ ] extension until _____

2. [ ] No extension of the time limit is granted and the time limit remains as previously set.

FAXED WRITTEN REQUEST TO FOLLOW!

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